

Figure 1

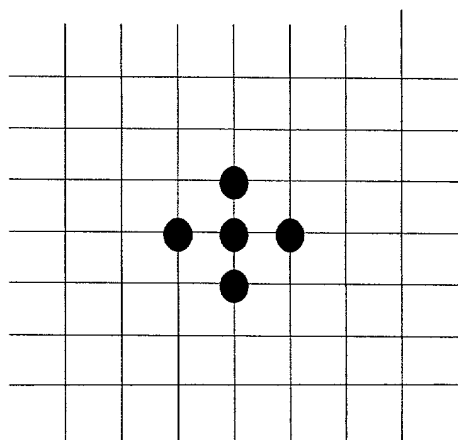
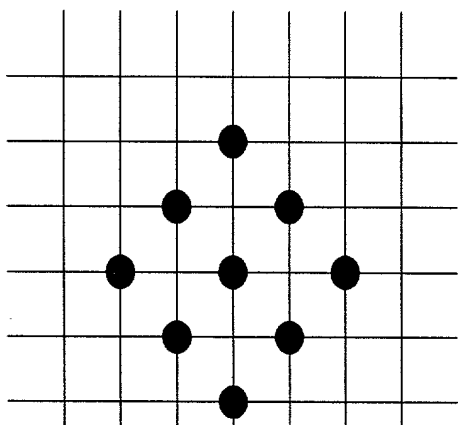


Fig. 2(a) Large Diamond Search Pattern (LDSP) Fig. 2 (b) Small Diamond Search Pattern (SDSP)

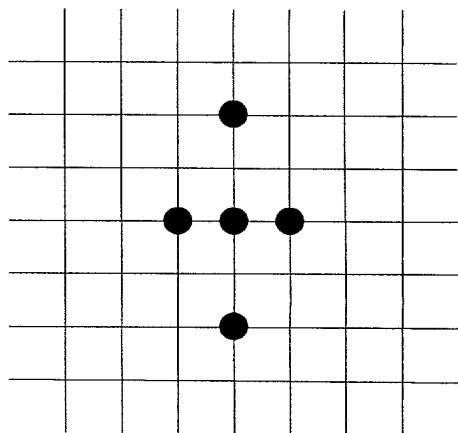
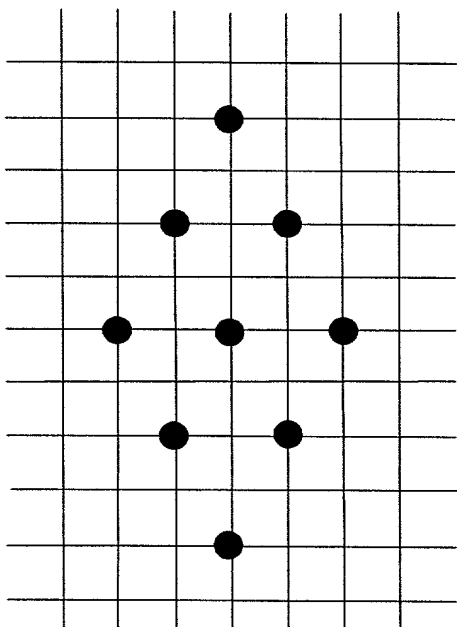


Fig. 3(a) Large Diamond Search Pat. (LDSP) Fig. 3(b) Small Diamond Search Pat.(SDSP)

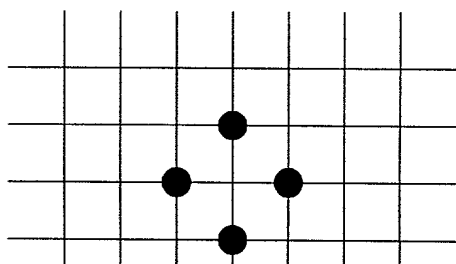
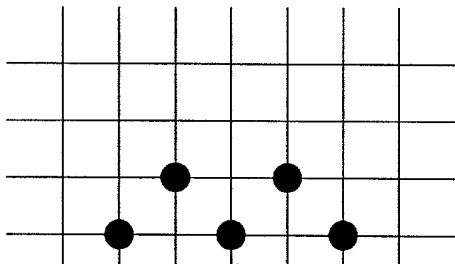


FIG.4 (a) Horizontal Hexagon Search Pattern (HHSP)

Fig. 4(b) Vertical Hexagon Search Pattern (VHSP)

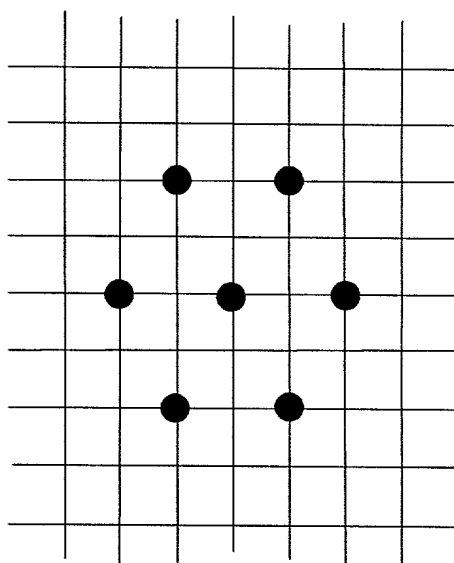


Fig. 4(c) Interlaced Hexagon Search Pattern (IHSP)

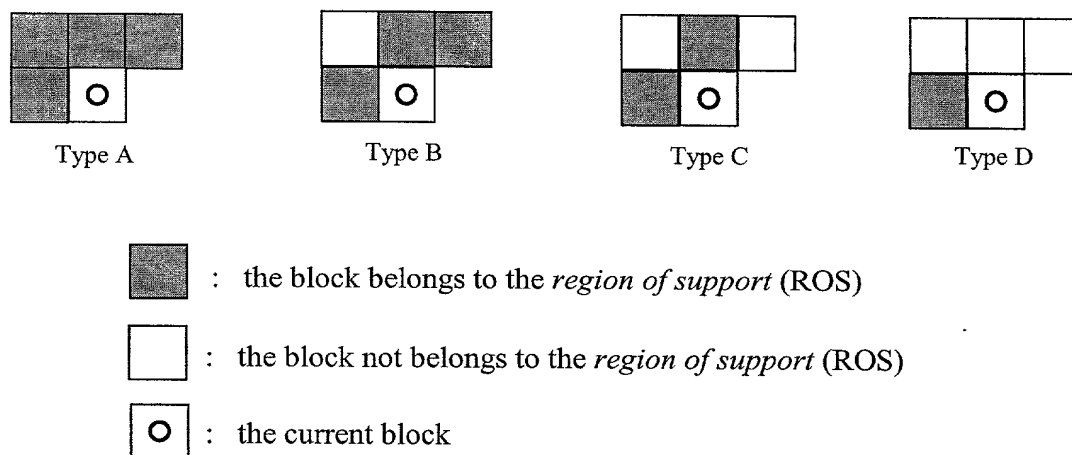


Figure 5: Various types of *region of support* (ROS)

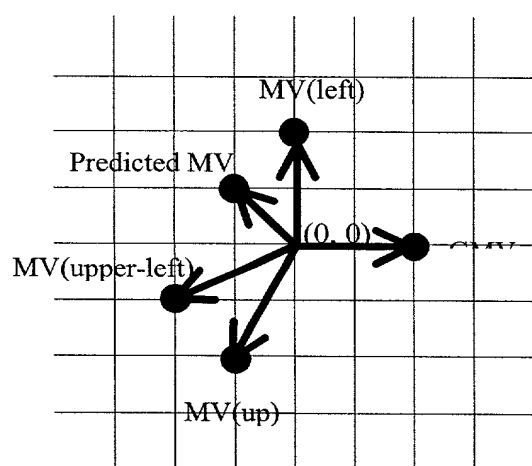


Fig. 6(a). Motion Adaptive Pattern (MAP)

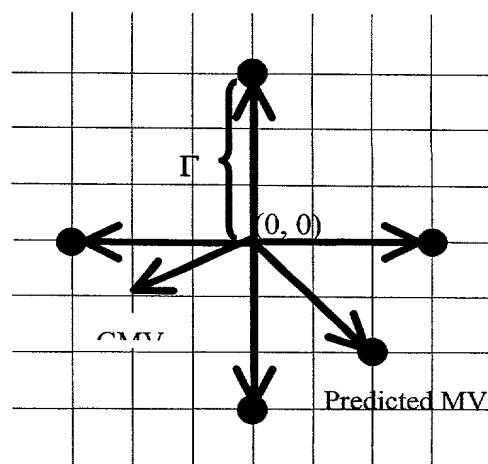


Fig. 6(b). Adaptive Rood Pattern (ARP)

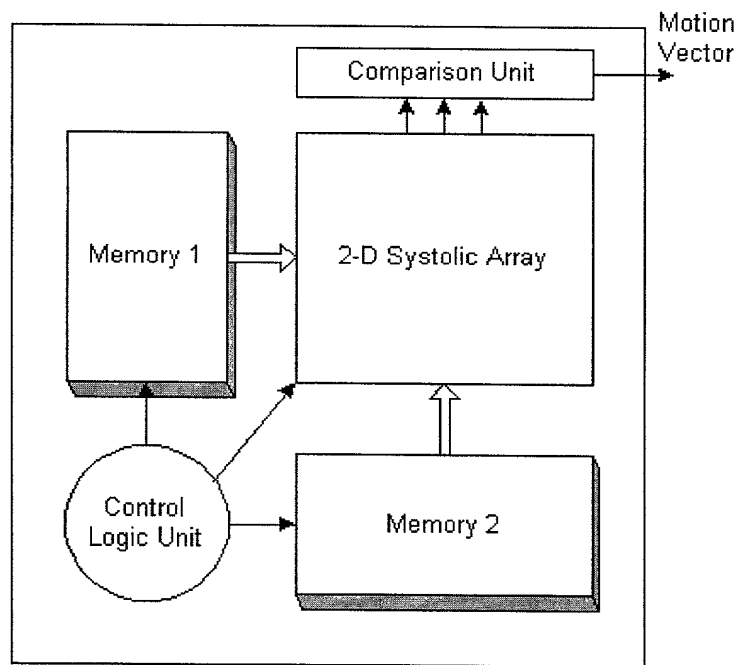


Fig. 7. A system architecture for a 2-D systolic array

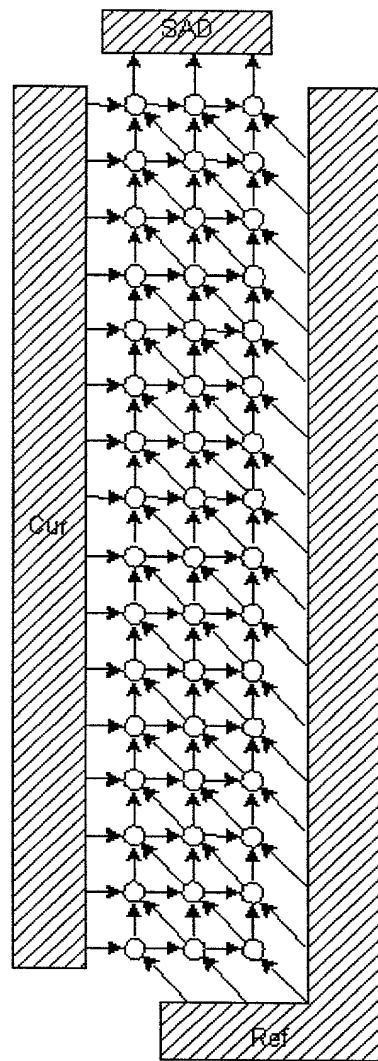


Fig. 8. An illustration of a systolic array organization

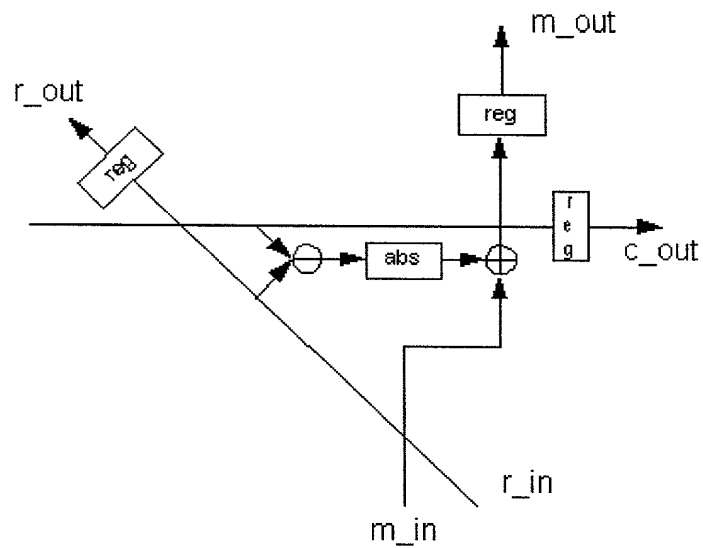


Fig. 9. A typical *processing element* (PE) structure

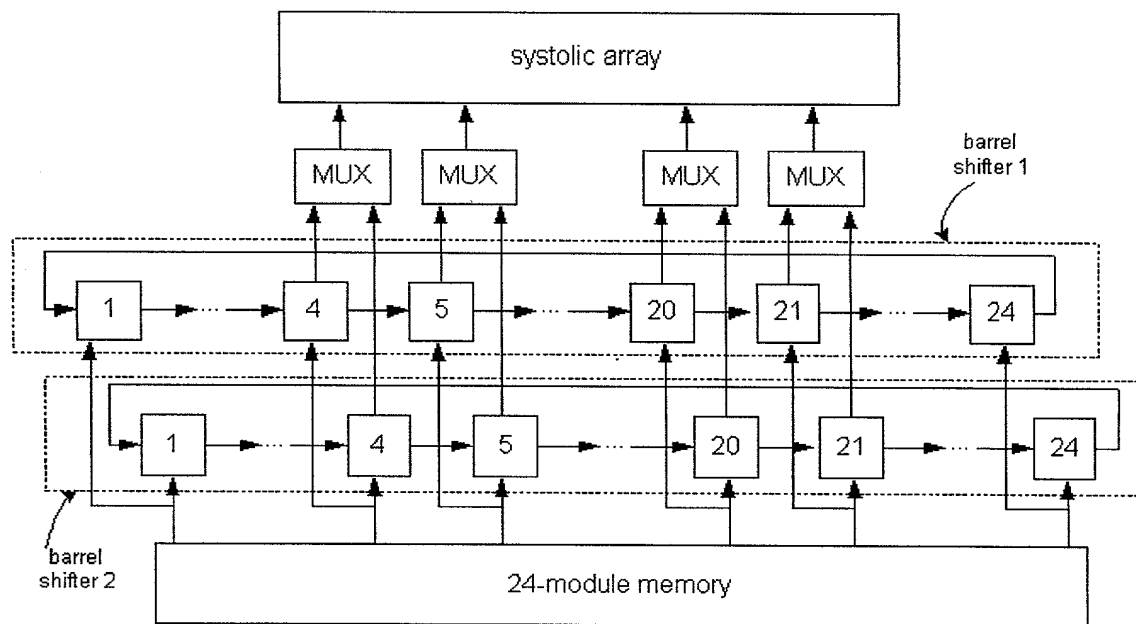


Fig. 10. An illustration of barrel shifter architecture

T=15		t=4	t=3	t=2	t=1	t=0	
C _{0,15}	...						
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⇒ Systolic Array
C _{13,2}	...	C _{2,2}	C _{1,2}	C _{0,2}			
C _{14,1}	...	C _{3,1}	C _{2,1}	C _{1,1}	C _{0,1}		
C _{15,0}	...	C _{4,0}	C _{3,0}	C _{2,0}	C _{1,0}	C _{0,0}	

Fig. 11(a) Current-block data

		Systolic Array									
		↑									
	t=0	r _{0,0}	r _{0,1}	r _{0,2}	r _{0,3}	...	...	r _{0,15}	*	*	
	t=1	r _{1,0}	r _{1,1}	r _{1,2}	r _{1,3}	...	...	r _{1,15}	r _{1,16}	*	
	t=2	r _{2,0}	r _{2,1}	r _{2,2}	r _{2,3}	...	...	r _{2,15}	r _{2,16}	r _{2,17}	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
	t=15	r _{15,0}	r _{15,1}	r _{15,2}	r _{15,3}	...	...	r _{15,15}	r _{15,16}	r _{15,17}	
slot 1	t=16	*	r _{16,1}	r _{16,2}	r _{16,3}	...	...	r _{16,15}	r _{16,16}	r _{16,17}	
slot 2	t=17	*	*	r _{17,2}	r _{17,3}	...	...	r _{17,15}	r _{17,16}	r _{17,17}	
	t=18	r _{1,-1}	r _{1,0}	r _{1,1}	r _{1,2}	...	...	r _{1,14}	*	*	
	t=19	r _{2,-1}	r _{2,0}	r _{2,1}	r _{2,2}	...	...	r _{2,14}	r _{2,15}	*	
	t=20	r _{3,-1}	r _{3,0}	r _{3,1}	r _{3,2}	...	...	r _{3,14}	r _{3,15}	r _{3,16}	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
	t=33	r _{16,-1}	r _{16,0}	r _{16,1}	r _{16,2}	...	...	r _{16,14}	r _{16,15}	r _{16,16}	
slot 1	t=34	*	r _{17,0}	r _{17,1}	r _{17,2}	...	...	r _{17,14}	r _{17,15}	r _{17,16}	
slot 2	t=35	*	*	r _{18,1}	r _{18,2}	...	...	r _{18,14}	r _{18,15}	r _{18,16}	
	t=36	r _{2,-2}	r _{2,-1}	r _{2,0}	r _{2,1}	...	...	r _{2,13}	*	*	
	t=37	r _{3,-2}	r _{3,-1}	r _{3,0}	r _{3,1}	...	...	r _{3,13}	r _{3,14}	*	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	

Fig. 11(b) Reference-block data

Fig. 11. Time scheduling of data: (a) Current-block data and (b) Reference-block data

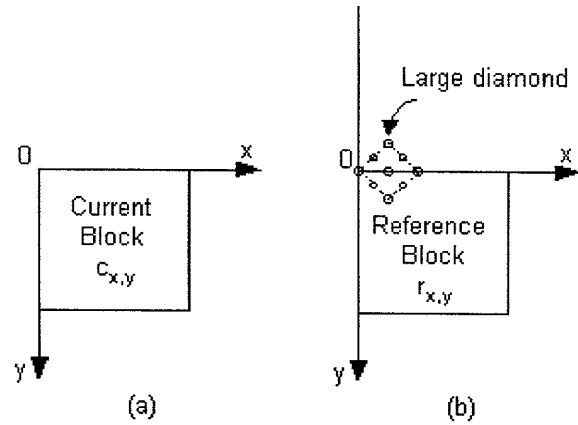


Fig. 12: The actual subscript positions with respect to the positions in: (a) the current and (b) reference images.

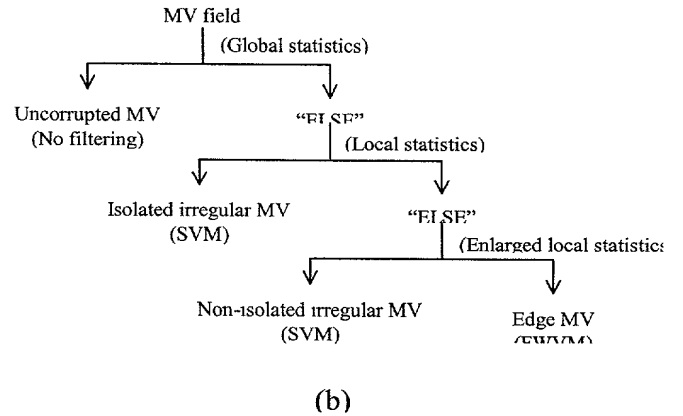
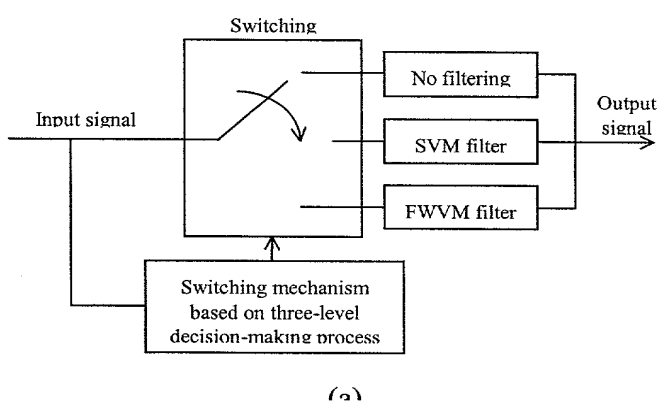


Figure 13: (a) The architecture of the switching-based median filter; (b) The hierarchical decision-making process for identifying each MV's characteristic and the corresponding filtering action taken.

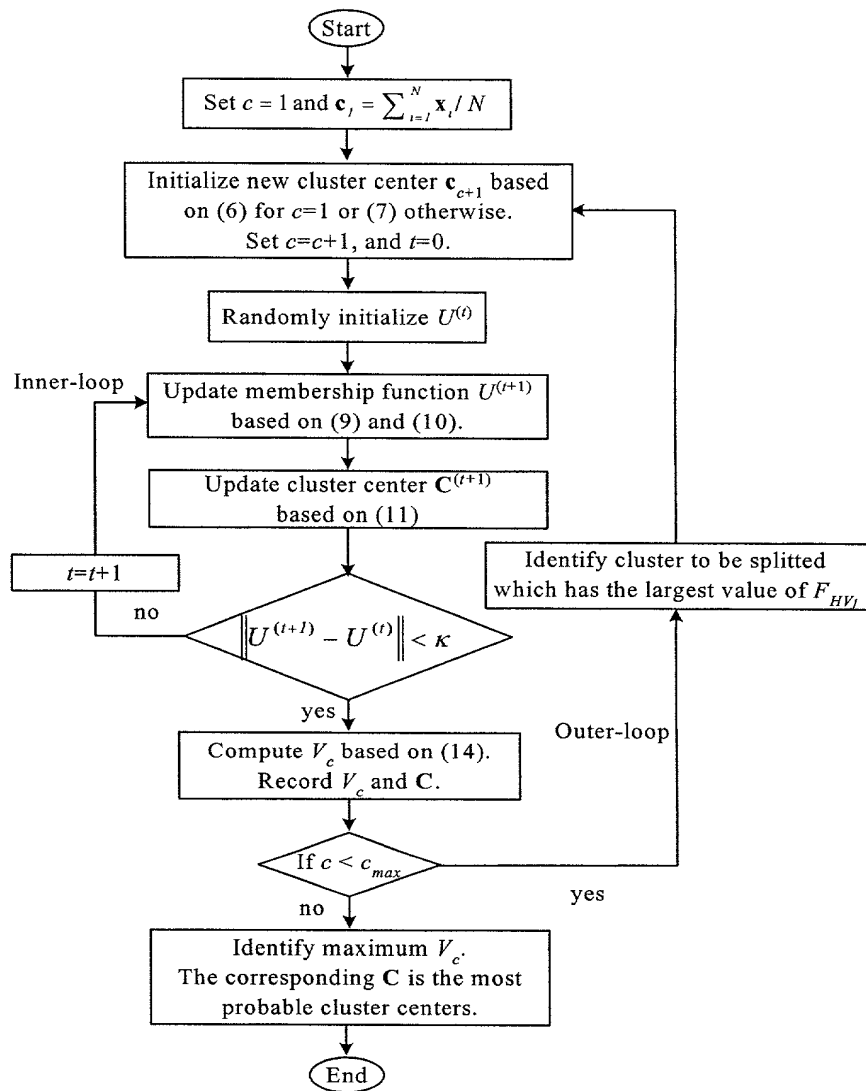


Figure 14: The architecture of the *maximum entropy fuzzy clustering* (MEFC) to achieve unsupervised identification of clusters without any *a priori* assumption.

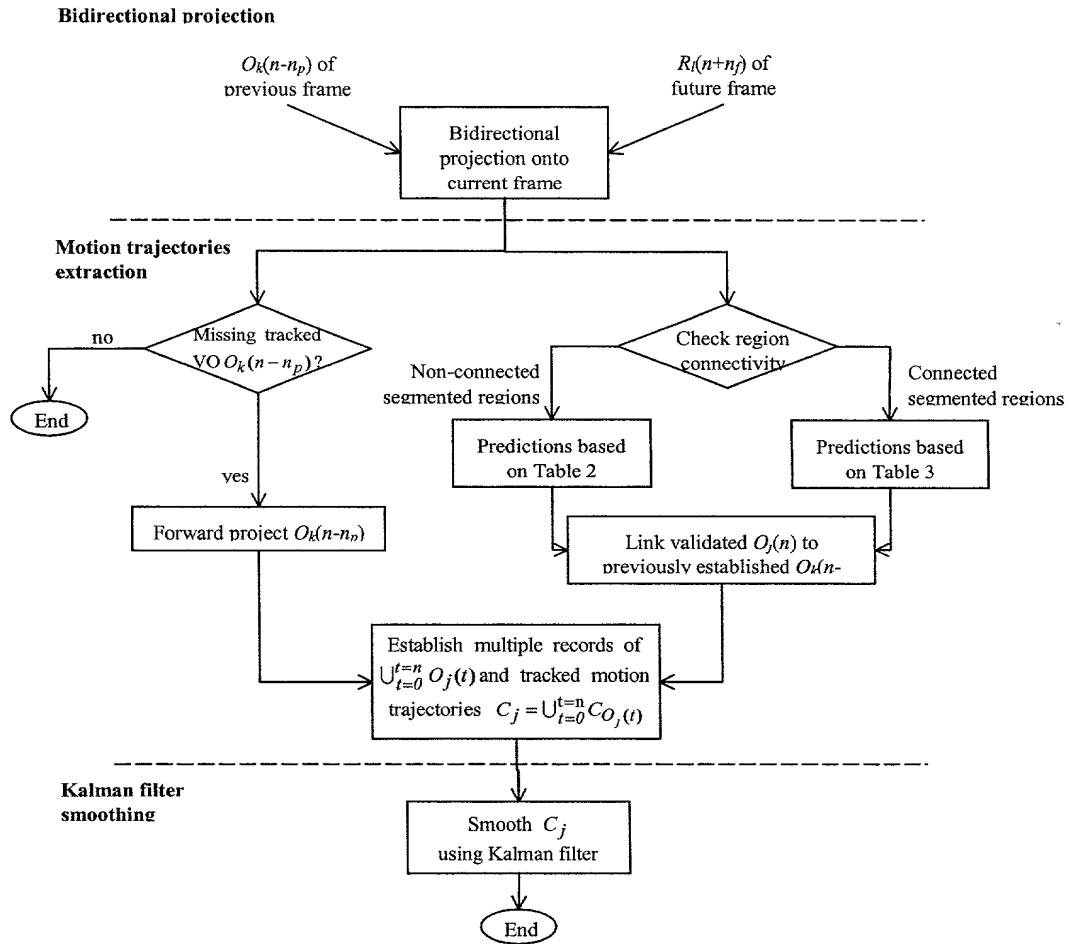


Figure 15: Three main stages of the bidirectional motion tracking scheme, comprising bi-directional projection, recursive VO tracking and validating, as well as Kalman filter smoothing.